UCT-0040

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Maurice Gell et al.	)	
		)	Group Art Unit: 1775
Serial No.:	10/755,856	)	
		)	
Filed:	January 12, 2004	)	Examiner: Savage, Jason L.
		)	
For:	COATINGS, MATERIALS, ARTICLES, AND METHODS OF MAKING THEREOF	)	

DECLARATION UNDER 37 CFR 1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Maurice Gell declares and states that:

1. I am an inventor of the above-identified U.S. patent application (hereinafter "the present application").

2. I am also an author of the Padture et al. article entitled "Towards Durable Thermal Barrier Coatings with Novel Microstructures Deposited by Solution Precusor Plasma Spray" (Acta Mater. 49 (2001) 2251-2257) (hereinafter "Padture").

3. Since 1993, I have been employed by the University of Connecticut as a Professor-in-Residence. The University of Connecticut and the Inframat Corporation are joint assignees of the above-identified patent application.

4. I graduated from Yale University with a Ph.D. Degree in Metallurgy in 1965.

5. The Padture article fails to teach or suggest a material comprising splats having an average diameter of less than or equal to about 2 micrometers, as recited in Claim 16 of the present application. Padture relates to forming ZrO_2-based thermal barrier coatings (TBCs) using a solution precursor plasma spray (SPPS) method. Padture describes the absence of splats in the SPPS-deposited TBCs shown in Figures 2 and 3. Moreover, the "rounded" aggregate shown in Figure 4(a) would not meet the limitation of being a splat having the claimed dimensions, as contended by the Examiner in the Office Action dated November 15, 2006. The material shown in Figure 4(a) was obtained by crushing an SPPS-deposited TBC and placing the resulting particles on a fine mesh grid. Each particle is believed to be representative of the general coating structure. The grid with the particles was placed in a transmission electron microscope (TEM). The thinnest particles could be imaged. The TEM image of those particles are depicted in Figure 4(a). The TEM image shows a random polycrystalline grain structure. In contrast, splats formed in an air plasma spray process appear as a columnar-grain structure. This columnar-grain structure results from the nucleation of many grains at the interface between the newly arriving molten splat and the previously deposited and solidified splats. There is a unidirectional extraction of heat normal to the splats that produce columnar grains parallel to the direction of heat flow. There is no evidence in Figure 4(a) of a columnar-grain structure that is characteristic of splats.

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6. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the patent.

Date: Feb. 12, 2007 Maurice Gell

Maurice Gell